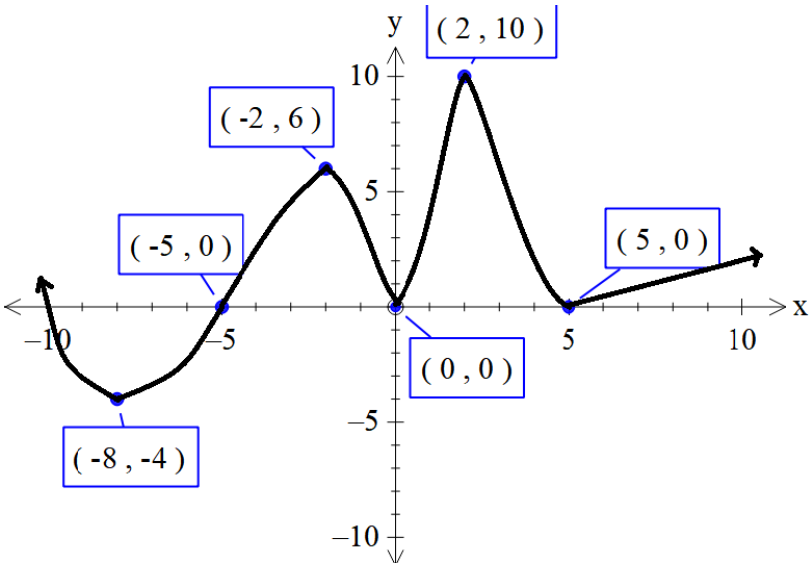
SM 3H 2017-18

3.3 Properties of Functions

Name _____ **Date** _____ **Period** _____

In problems 1-10, use the graph of the function *f* given.



1. Is *f* increasing on the interval (-8, -2)?

2. Is *f* decreasing on the interval (-8, -4)?

3. Is *f* increasing on the interval (2, 10)?

4. Is *f* decreasing on the interval (2,5)?

5. List the interval(s) on which *f* is increasing.

6. List the interval(s) on which *f* is decreasing.

7. Is there a local maximum value at $x = 2$? If yes, what is it?

8. Is there a local maximum value at $x = 5$? If yes, what is it?

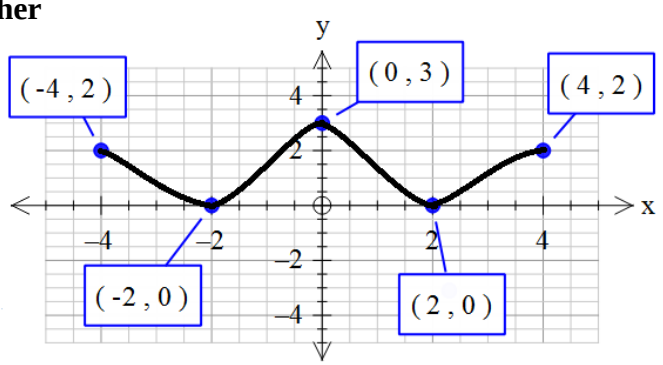
9. List the number(s) at which *f* has a local maximum. What are the local maximum values?

10. List the number(s) at which *f* has a local minimum. What are the local minimum values?

In problems 11-14, the graph of a function is given. Use the graph to find:

(a) The intercepts, if any (b) The domain and range (c) The intervals on which it is increasing, decreasing or constant (d) Whether it is even, odd or neither

11. a)_____



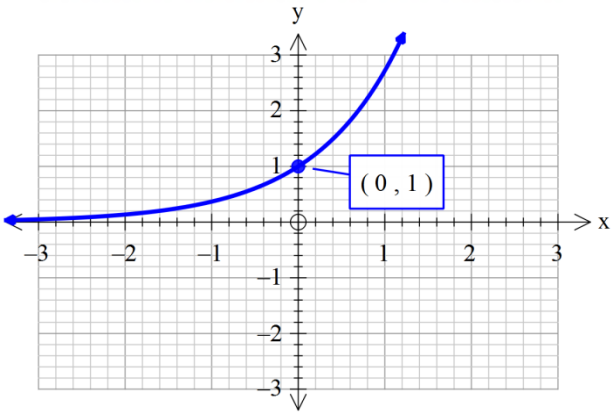
b) _____

_____

c) _____

d) _____

12. a)_____



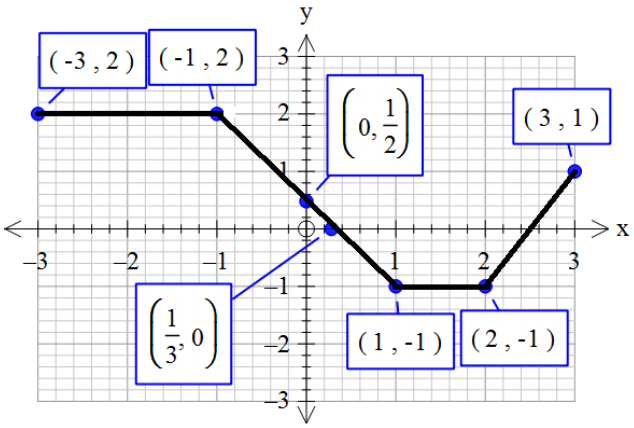
b) _____

_____

c) _____

d) _____

13. a)_____



b) _____

_____

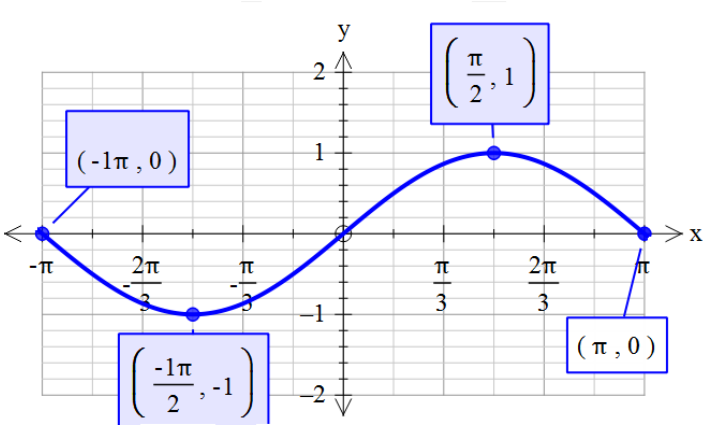
c) _____

d) _____

14. a)_____

b) _____

_____



c) _____

d) _____

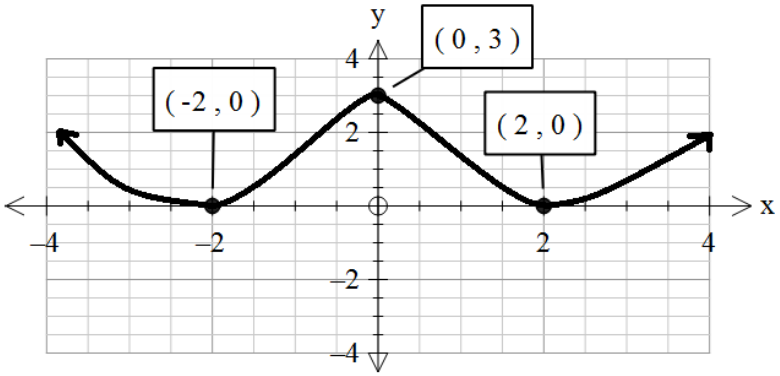
In problems 15-16, the graph of a function *f* is given. Use the graph to find a) The numbers, if any, at which *f* has a local maximum value. What are the local maximum values? b) The numbers, if any, at which *f* has a local minimum value. What are the local minimum values?

15. a)_____

_____

b) _____

_____

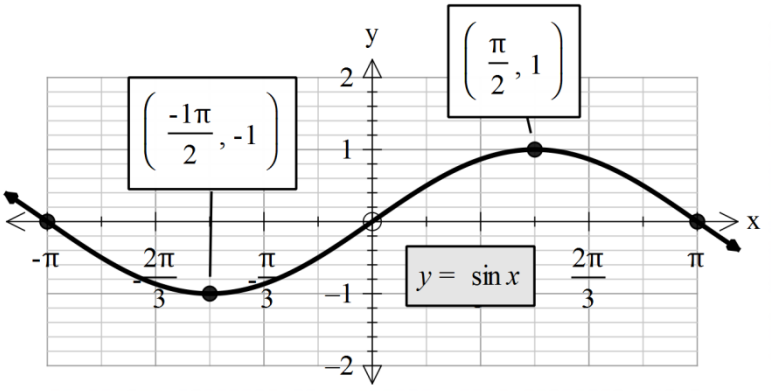


16. a)_____

_____

b) _____

_____



Determine algebraically whether each function is even, odd or neither. Show work!

18. $f(x)=4x^3$

19. $f(x)=-3x^2-5$

20. $f(x)=3x^3+5$

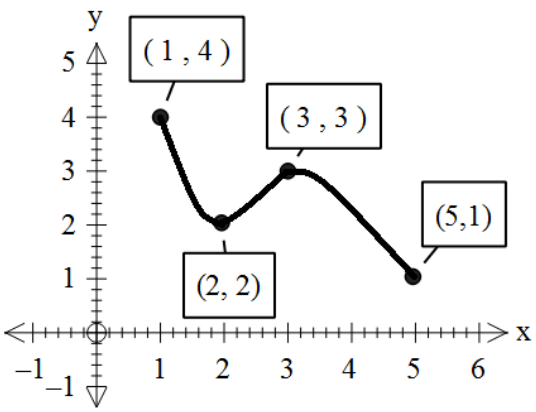
21. $f(x)=\sqrt[3]{x}$

22. $f(x)=x+|x|$

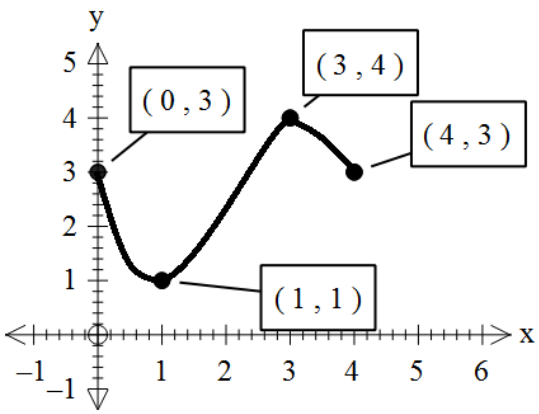
23. $f(x)=\frac{1}{x^2}$

For problems 24-26, for each graph of a function y = f (x), find the absolute maximum and the absolute minimum, if they exist.

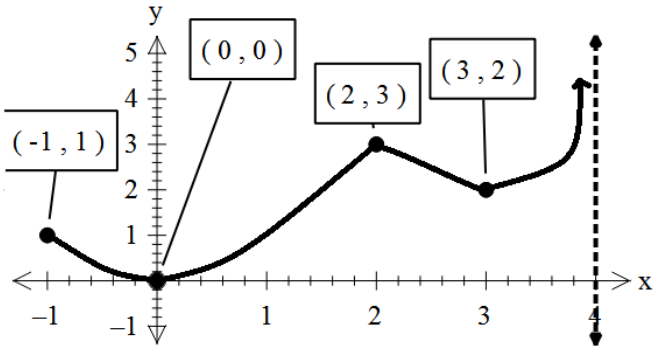
24.



25.



26.



Find the average rate of change for each function in the intervals given.

27. $f(x) = -2x^2 + 4$

a) [0, 2] b) [1, 3] c) [1, 4]

28. $f(x) = -x^3 + 1$

a) [0, 2] b) [1, 3] c) [-1, 1]

29. $f(x) = x^2 - 2x + 3$

a) [0, 2] b) [2, 5] c) [-1, 1]

Review

30. Factor: $3x^4 - 9x^3 - 12x^2$

31. Simplify: $\frac{x}{x-2} - \frac{3}{x+4}$

32. Solve: $\frac{x}{x-2} - \frac{3}{x+4} = 2$

33. Solve: $\sqrt{2x+28} = x - 4$